1.9
P69P

LIBRARY
RECEIVED
☆ MAY 7 1938 ☆
U. S. Department of Agriculture

THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

Volume XXII Number 8

May 1, 1938

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXII Number 8

May 1, 1938

IN THIS ISSUE

The first occurrence of scab on peas, the most severe outbreak of potato late blight since 1931, and airplane dusting for disease control, are some features of the vegetable disease situation in the Lower Rio Grande Valley of Texas this year, as reported by G. H. Godfrey, page 122.

A. G. Newhall reports the earliest appearance of onion downy mildew ever recorded in New York, page 124.

Lettuce anthracnose was very severe in some fields in the Salinas Valley, California, as reported by M. W. Gardner and J. B. Kendrick, page 125.

A note on hop anthracnose, which has been found only a few times, is contributed by John A. Stevenson, page 125.

The tobacco downy mildew situation in North Carolina is reported by Luther Shaw, page 127.

Appearance of tobacco downy mildew about three weeks earlier than last year is reported by J. A. Pinckard, Jr., from Virginia, E. A. Walker from Maryland, and C. C. Allison from Tennessee, page 127.

E. E. Clayton sends additional reports on downy mildew, page 128.

Tobacco wildfire is reported from Maryland by E. A. Walker, page 128.

Neil E. Stevens reports fluctuations in the incidence of corn ear rots in the corn belt from 1935 to 1937, page 129.

Leaf rust is serious in the major wheat-growing areas of Oklahoma, according to K. Starr Chester, page 133.

Early appearance of wheat leaf rust in Kansas is reported by C. O. Johnston on page 143.

The condition of small grains in western Texas is reported by I. M. Atkins, page 135.

Apparently the first appearance of rust on cultivated flax in Texas is reported by G. E. Altstatt, page 137.

The development of fruit diseases in New York is reported by D. H. Palmiter, W. D. Mills, and others, page 137.

Reports on apple scab are given for Massachusetts by O. C. Boyd, Rhode Island by Frank L. Howard, and Maryland by E. A. Walker, page 138.

Blister rust infection on whitebark pine in the Northwest is reported by T. W. Childs, J. L. Bedwell, and G. H. Englerth, page 139.

Paul V. Siggers contributes two short notes on tree diseases in Louisiana, one a disease of unknown cause on sycamore, the other dying of Pinus palustris caused by Fomes annosus, page 140.

Florence Hedges reports the results of a field survey of some Michigan bean-growing sections during the fall of 1937, page 141.

Brief notes, page 143, include reports on onion mosaic in Kentucky, by W. D. Valleau, lettuce diseases on Long Island, by Orson S. Cannon, cereal diseases in California, by C. A. Suneson, a request for additional information on onion downy mildew and wheat leaf rust, and a report on wheat leaf rust in Kansas, by C. O. Johnston.

NOTES ON VEGETABLE DISEASES IN THE LOWER RIO GRANDE VALLEY IN THE SPRING OF 1938

G. H. Godfrey

The spring vegetable crop this season in Lower Rio Grande Valley met with many adverse conditions, particularly as regards insect damage, but also with adverse weather conditions and plant diseases.

English peas. During the period of moist, cold weather in January, English peas in one portion of a sixty-acre field developed a leaf and stem spot that answered the description by Snyder in California (Phytopath. 24: 890-905. 1934). The causal organism was a Cladosporium, probably C. pisicola Snyder. This constitutes the first report of this disease in Texas. With a change to warm, drying weather, the disease was checked, naturally, before any great damage was done.

Cabbage black rot [Bacterium campestre]. With a shortage of Washington grown seed (see Plant Disease Reporter 21 (9): 170-172. 1937), black rot was everywhere abundant and was the cause of considerable economic loss. Spread was increased by a uniformly heavy infestation of cabbage worms throughout the Valley.

Carrot leaf blight, Macrosporium carotae. This disease was again almost universally present in the Valley. In large commercial fields, it was checked by applications by airplane of copper-lime dust applied in the early morning on the dew covered plants. In this way many fields were marketed as green carrots whereas without such treatment, many fields were lowered to the bag carrot class.

Potato late blight, Phytophthora infestans. The outbreak of this disease during the present season, beginning the latter part of February and extending through March, was the worst that has occurred in the Valley since 1931. For the first time in many years, the disease extended beyond the more moist coastal county (Cameron) into the somewhat less moist Hidalgo County. In many fields in Cameron County that had not been prepared by protective spraying or dusting, the loss was total. In general, however, spraying or dusting was resorted to and good yields were obtained. Since many of the fields were large ones, ranging from twenty to several hundred acres in area, the application of copper-lime dust by airplane was extensive. Some two hundred thousand pounds of copper-lime dust were applied by this means alone. Leaf prints made by the Blodgett-Mader process showed good coverage in general by this method. Some planes were better equipped for getting good coverage than others. The poorer ones gave upper surface coverage alone, except where the plane rose to pass over a line of trees or a power line when the draft from

the propeller forced the dust downward, producing a "swirl" that brought about good under-surface coverage. Another operator with planes equipped with a special type of "venturi tube" appeared to be capable of delivering the dust with a greater down draft which brought about a rolling effect of the dust and good under-surface as well as upper surface coverage than did other operators in the Valley. From the point of view of practicability and economics, airplane dusting with fungicides has been proved to be highly efficient in the Lower Rio Grande Valley.

Potato early blight, Macrosporium solani [Alternaria solani]. This disease was somewhat irregular in incidence during the present season. In general fields were harvested before much damage was done. In one large field in Hidalgo County, however, the damage due to this disease alone was extreme, and the loss was probably 50 percent.

Potato degeneration diseases. Where certified seed from northern seed producing states (principally Nebraska) were used, the incidence of mosaics of various types was low--probably not exceeding 2.5 percent. Where non-certified seed was used the fields were obviously poor in appearance, and in many cases 20 or 25 percent of the plants were infected with mosaic. There is no question but that the additional expense involved in buying certified seed from definitely reliable sources is justified for Lower Rio Grande Valley plantings.

Tomato early blight, Macrosporium solani [Alternaria solani]. This disease, ordinarily a limiting factor in tomato production, has made its appearance as usual, and though the shipping season has not yet commenced, the blight lesions are to be found on leaves, leaf petioles, and even main plant stems. In one field of Rutgers that was only partially dusted with a copper containing fungicide under ideal conditions of dew-moistened plants, the incidence of disease is only a trace as compared with much heavier infection in the non-dusted portion.

Tomato root knot nematode [Heterodera marioni]. On April 7 one grower brought in plants that in spite of recommended fertilizer applications had failed to make good growth. The roots were uniformly heavily infested with nematodes that were probably responsible for the weakness of the plants. Judging from previous observations, the loss in the field will probably be at least 50 percent.

Tomato wilt, Fusarium lycopersici [F. bulbigenum lycopersici]. A non-resistant variety growing on the station grounds is already showing severe wilt.

Dill leaf and stem blight, Cercosporina anethi. This disease, reported last year to the Plant Disease Survey along with specimens, is again severe this season. Some hundreds of acres are involved, the crop

being grown for a special New York market. During periods of warm, moist weather, the plants are rendered unmarketable by the uniform heavy infection of the entire plant. That the disease was seed-borne was shown this season, strikingly, by the severe incidence of the disease in young seedlings. One field of twenty acres was killed outright at this stage in its growth. A seed treatment experiment in which dust treatments with ethyl mercury chloride, cuprous oxide, and zinc oxide were given, showed marked improvement in stand and growth of treated rows over the controls, but not complete control of the disease. Further tests with dust fungicides on the growing plants are to be made.

(Lower Rio Grande Valley, Substation, Texas Agricultural Experiment Station, Weslaco, Texas).

ONION DOWNY MILDEW APPEARS IN NEW YORK

A. G. Newhall

In view of the supposed importance of the backyard plantings of top set onions as initial sources of primary inoculum of Peronospora destructor each spring in New York State, it may be of more than passing interest that the mildew was found fruiting on such onions in three small plantings in and near Ithaca on April 19. This is the earliest recorded appearance of onion mildew in New York, although it may have been present before the recorded date of its discovery, May 12, in 1937.

The plants were known to have been diseased nearly 100 percent last fall but less than 5 percent show symptoms to date. In all cases it showed up on the outer, older green leaves. There is ample time for lots of secondary spread within these plantings and then for a few spores to find their way to the early commercial crop of set onions in June and to the late crop in July. Much depends upon the weather of the next two months.

In certain townships of Wayne County, local committees of interested onion growers are getting eradication campaigns started this week in their districts.

(New York (Cornell) Agricultural Experiment Station, April 25).

LETTUCE ANTHRACNOSE IN CALIFORNIA

M. W. Gardner and J. B. Kendrick

Anthracnose of head lettuce caused by Marssonina parattoniana was observed on March 29 in a number of fields of early lettuce in the Salinas Valley, California, causing a total loss in some fields. The numerous lesions caused a blighting of successive whorls of the older leaves. The lesions often coalesced and killed the tissues of the base of the leaf so that the leaf was promptly broken off and blown away by the wind. The result was that the badly affected areas in the fields were characterized by dwarfed heads on long bare stems with no expanded lower leaves. This disease was first observed in one field last year, and this year was fairly widespread. Presumably the high rainfall and prolonged periods of wet weather in February and March, 1938, were favorable to the disease.

(University of California).

A NOTE ON HOP ANTHRACNOSE

John A. Stevenson

With the revival of interest in the hop plant (Humulus lupulus), which has come about in recent years, fungus diseases unfortunately have also entered the picture. An anthracnose or leaf-spot disease, very characteristic in appearance, though apparently not at all common, was collected at Argonne, Wisconsin, and the specimen submitted for examination by Prof. R. E. Vaughan.

This disease is characterized by numerous amphigenous lesions on leaf blades and petioles, which may or may not be bounded by the veins, but which are often grouped along them. The spots are circular at first, becoming angular to irregular, a dull light brown in color to ashen, 1-2 mm. in diameter, coalescing at times, with definite slightly raised margins on both leaf surfaces, the centers of spots tending to fall out. Acervuli occur in the older portions of the spots, pink at first, fading with age. Setae are few and scattered, breaking off in older specimens; conidia hyaline, 1-celled, straight or occasionally slightly curved, oblong with rounded ends, or in some cases more nearly acute, variable in size, ranging from 7-18 x 3-5 mu.

On morphological grounds there does not appear to be any reason for considering the organism involved here as other than another conidial form of the ubiquitous Glomerella cingulata (Stonem.) Spaulding & V.

Schrenk. The fungus as it occurs on the hop leaves falls easily within the bounds of this species as set forth by Shear and Wood in Bureau of Plant Industry Bulletin 252, Studies of fungous parasites belonging to the genus Glomerella.

The Plant Disease Survey has but one previous report of anthracnose on hop, a record of Colletotrichum sp. on cultivated hops for New York State in 1923.

Several specimens of what appear to be the same disease have been found in the Mycological Collections. The earliest of these was collected by May Varney, a member of the staff of the Division of Vegetable Physiology and Pathology, on "wild hop" at Manhattan, Kansas, May 1890, and a second on June 2 in the same locality. B. T. Galloway obtained a specimen of what is apparently the same disease at Garrett Park, Maryland, which is not far from the District of Columbia, on May 3, 1891. A fourth specimen, without definite collection data, is also in the collection, having apparently been used as an exhibit specimen at the Chicago World's Fair in 1893. These four specimens were referred to the genus Colletotrichum by Miss Varney, and she had assigned tentatively the specific epithet, humuli. Her notes filed with the second Kansas specimen do not give any characters which would indicate that the fungus involved is other than Gloeosporium cingulatum. She notes setae present or absent, and "conidia hyaline, continuous, elongate, elliptical to oblong, cylindrical, sometimes slightly curved, 13-20 x 5-6 mu., mostly 15-18 x 5 mu." She also adds that generally older and lower leaves were most affected.

Except for the second Kansas specimen, the spots on these older specimens reach a larger diameter (3-6 mm.) than those described for the Wisconsin collection.

Still another specimen of this disease has come to light, collected by John Turley at LaGrange, Indiana, June 3, 1890, and tentatively assigned by Miss E. A. Southworth, also a member of the staff of the old Division of Vegetable Physiology and Pathology, to Colletotrichum again with the "pro tem" specific designation humuli. The complete combination was never published by either Miss Varney or Miss Southworth. This latter specimen resembles in all respects the one from Wisconsin.

Two species of Gloeosporium have been reported from Europe on dead stems and cones of Humulus, but no reports of a Colletotrichum have been located. Gloeosporium allantosporum Fautrey was described from France with conidia 32-35 x 3-4 mu., which would appear to be much longer than those of typical Gloeosporium cingulatum, and certainly much beyond the range of the fungus on the American hop leaves. Gloeosporium mutinense Trav. & Sacc. has been reported from Italy, the conidia being 14-18 x 3 mu., rather narrow but still not beyond the range of G. cingulatum, so that this again may be the same organism. No reports of anthracnose on leaves have been found.

(Division of Mycology and Disease Survey).

DOWNY MILDEW (BLUE MOLD) DEVELOPMENT IN NORTH CAROLINA

Luther Shaw

A general outbreak of downy mildew [Peronospora tabacina] on tobacco occurred in eastern North Carolina during the last week of March and the first two weeks of April. The general outbreak in 1938 did not develop so quickly following primary infections in old bed sites as it did in 1937 in this area. Furthermore, the advanced development of the tobacco plants at the time of infection combined with weather conditions generally unfavorable for development of the parasite has prevented substantial damage. It is estimated that less than 5 percent of the plants in infected beds in eastern Carolina were killed by the parasite. Owing to the advanced condition of the plants and the unfavorable weather conditions for mildew development, the infected plants recovered quickly and the growers either were or will be able to transplant their crop at the normal date of transplanting. Essentially no alarm over downy mildew was expressed by farmers in eastern North Carolina this year. In fact many growers were pleased when it appeared in their beds and held the plants back. Some even went so far as to attempt to artificially inoculate their beds with the parasite to accomplish the same purpose.

Downy mildew is now present in an active state in the middle and old belts, but as yet has caused no substantial damage. It appears evident that farmers in these belts will also have an adequate supply of recovered plants at the normal date of transplanting.

The so-called sanitary method of controlling downy mildew, which involves early seeding of excess bed space on new sites in open exposures, has given excellent practical control in North Carolina this year. The widespread adoption of the sanitary method by North Carolina farmers, combined with good stands, rapid early development of plants, and early indications of mild downy mildew development, made it inadvisable to encourage in North Carolina widespread farmer adoption of the chemical methods of control now being investigated experimentally.

(North Carolina Agricultural Extension Service).

DOWNY MILDEW OF TOBACCO APPEARS IN VIRGINIA, MARYLAND, AND TENNESSEE

VIRGINIA: Downy mildew of tobacco (blue mold) was found in the bright tobacco area of Virginia, near Danville, on April 11, following cold rains and frost. The disease appeared first on old bed sites and is more than two weeks earlier than last year, having made its appearance in 1937 on April 29.

At the present time, the disease is well distributed over south side Virginia. Plants are generally about two weeks advanced. (J. A. Pinckard, Jr., April 20. Tobacco Experiment Station, Chatham).

MARYLAND: Tobacco blue mold [downy mildew] (Peronospora tabacina) was observed by County Agent J. Julius Johnson at Oakley, St. Mary's County, Maryland on April 21 in two spots in one bed. This was a new bed with no old beds within one quarter of a mile of it. Plants in the bed ranged in size from the size of a dime to 1-3/4 inches tall. The writer examined specimens on April 22 and found typical Peronospora spores which were freely germinating on April 23, 12 hours later. Downy mildew was reported by County Agents J. B. Morsell of Calvert County and P. D. Brown of Charles County on April 21 and 22 respectively. Doctor Mark Woods on April 22 examined the specimens and found Peronospora spores. The bed location is not known in latter counties. Its appearance this year is 20 days ahead of last year. (E. A. Walker, April 25. University of Maryland, Extension Service).

TENNESSEE: C. C. Allison received downy mildew specimens from the vicinity of Nashville, Tennessee on April 19, which is three weeks ahead of any report last year. The disease has not yet been found in east Tennessee. (E. E. Clayton).

ADDITIONAL REPORTS ON TOBACCO DOWNY MILDEW

(Transmitted by E. E. Clayton, Division of Tobacco and Plant Nutrition).

SOUTH CAROLINA: W. M. Lunn reports that blue mold is still somewhat active but has not caused serious damage. Because of early drought and resulting poor stands, many growers have not yet set out their full crop. (April 22).

NORTH CAROLINA: A two day trip (April 20 and 21) through the eastern area, in company of K. J. Shaw, shows that blue mold has been general and many beds were seriously defoliated. The plants were early however and hence the delay will not be serious. Few plants were killed.

In the vicinity of Oxford, North Carolina the disease was developing actively on April 23 and 24 with the outcome yet to be determined.

TOBACCO WILDFIRE IN MARYLAND: Tobacco wildfire [Bacterium tabacum] was observed to be doing more damage than usual on young plants in St. Mary's County plant beds. It is appearing mostly as a systemic infection rather than as distinct local spots with characteristic halo. (E. A. Walker, April 25).

FLUCTUATIONS IN THE INCIDENCE OF CORN EAR ROTS IN THE CORN BELT, 1935-37

Neil E. Stevens

Accurate measurements of the losses from plant diseases are still so rare as to be exceptional. No doubt most of our information regarding losses from plant diseases and the fluctuations in these losses must, for a long time, be derived from estimates. But wherever measurements are available, they are useful, not only in themselves, but as a check on the conventional crop loss estimates. Koehler's figures (Illinois Agr. Exp. Sta. Ann. Rept. 48: 54. 1936) furnish an excellent check on the estimates of losses due to corn ear rots in Illinois from 1924 to date. Detailed information as to losses from these rots are now available for 1935-37 from the corn yield or performance tests in Ohio, Indiana, Illinois, and Iowa, and in the cooperative uniform comparisons of top crosses conducted by the Division of Cereal Crops and Diseases, United States Department of Agriculture, in cooperation with the various experiment stations.

Beginning with the 1935 crop, those associated in the Corn Breeding program undertook to measure the losses from ear rots sustained by the various lines under test in terms of percentage damaged kernels in shelled samples. This work was begun under the supervision of members of the staff of the Grain Division of the United States Bureau of Agricultural Economics, and every effort was made to have the results comparable, not only in the different states and seasons, but as nearly as possible with the grading regularly carried on by the licensed inspectors. The purpose was, of course, to afford an effective method of measuring the capacity of the different lines to produce sound corn. Incidentally, however, this method of work, if followed out, should give an additional indication of the amount of loss due to ear rots at harvest time. This information for the last three years is summarized in the following pages. The figures used are either taken directly from, or computed from, those published in the various papers cited, where the detailed records are, of course, available to anyone. They are here summarized and brought together for comparison. Like the reports of licensed inspections, they furnish an objective measure of the percentage of diseased kernels present in samples of shelled corn. They differ from those reports, however, in that they deal with corn as it comes from the field, whereas the inspection reports are based on corn received at terminal markets. These reports, combined with the June total damaged corn surveys, should in time give some information as to the losses which occur in commercial storage.

The State Corn Performance Tests

The plans of the corn performance tests differ somewhat in the several States. Accordingly, comparison should be made of the amount of rot in the different years within each State rather than between States. The tests were carried out in a number of localities representative of different sections. Eight localities were chosen in Ohio, 15 in Illinois, and for Iowa 9 in 1935 and 12 in 1936 and 1937. Indiana reported 21 experiments in 1935 and 1936, 13 in 1937. Since the number of entries in each experiment is relatively large, rarely as few as 10 and sometimes as many as 100, and the strains selected were supposedly adapted to that region, it appears that little error would be involved in averaging all of the figures for a given experiment. At least in the opinion of those well qualified to judge, this would be more accurate than using only figures from entries common to several tests, a procedure which would undoubtedly place the less-adapted lines at a disadvantage in some localities. Table 1 gives the figures obtained in this way for Ohio, which are representative. The mold counts were made on samples of one-half pound or more reduced on the Boerner Sampler from each of the "moisture samples". The moisture samples were lots of 10 pounds or more taken from each of three replications (five in the Wooster experiment). Similar tables were, of course, compiled for the other States, but to include them here seems superfluous since anyone especially interested can obtain them in the original. It may be noted, however, that the highest percentages of "total damage" noted for the period in any field were Indiana 7.3, Illinois 7.8, and Iowa 7.8.

Table 1. Losses from ear rots in Ohio corn varietal experiments, 1935-37, expressed as average percent moldy grain by weight.

County	1935	1936	1937
Trumbull	0.4	5.3	0.2
Wayne (Wooster, Ohio)	0.8	0.6	0.7
Henry	4.8	1.3	0.5
Miami	3.2	8.2	0.2
Montgomery	1.2	2.8	0.8
Hamilton	2.4	6.7	0.8
Clermont	0.8	7.2	0.7
Meigs	2.3	3.2	0.3

In order to obtain a figure for the whole State that might be compared with the crop loss estimate, an average was taken of the means for all the different localities. In Iowa, because the number of open pollinated lines was small, the figures for hybrids alone were included. Results are given graphically in Figure 1.

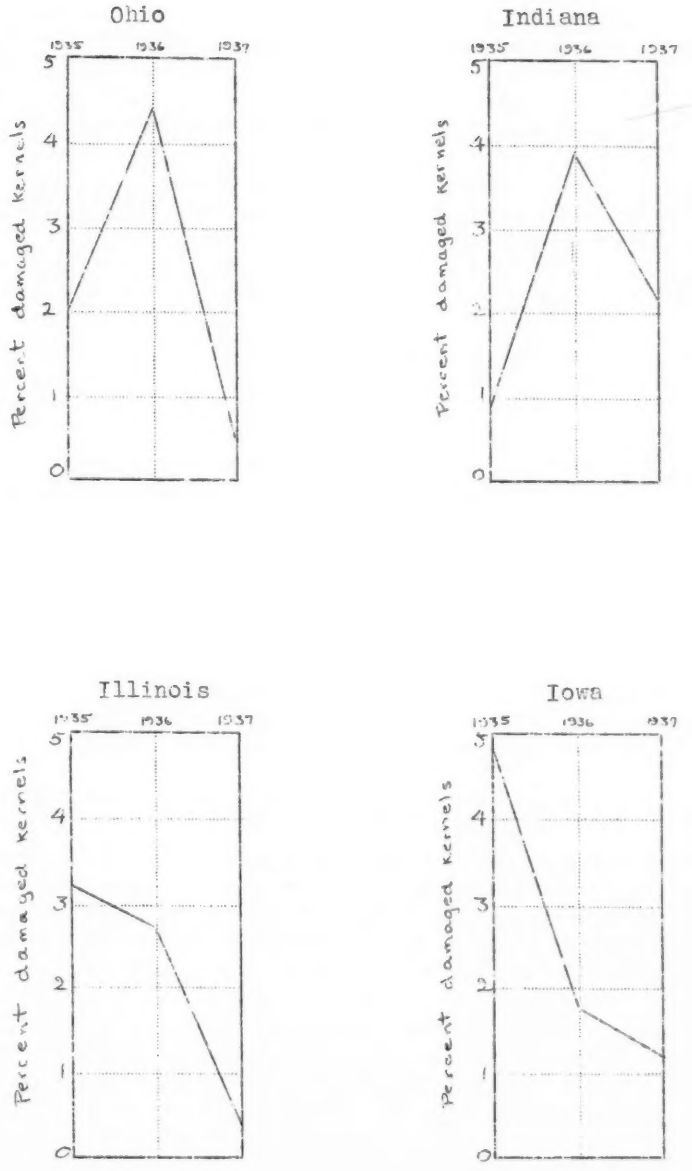

Figure 1. Losses due to ear rots in the corn performance tests in various States expressed as percent damaged (diseased) kernels by weight. See text for details.

The Cooperative Uniform Comparisons of Corn Hybrids

As already emphasized, the foregoing figures are useful chiefly as a means of comparing one season with another within a given State. Some idea of the variation in loss from ear rot which may occur in different localities in a single group of corn hybrids may be derived from the results of the comparative uniform top crosses already mentioned.

In 1935 and 1936 the uniform tests included 19 inbred lines top crossed with Krug and the Krug variety, and were graded as to the amount of loss due to ear rots (damaged kernels). Only five of the inbreds were common to both years. The figures given in Table 2 are thus not comparable as between 1935 and 1936, and of course, are not to be taken as representative for the States. They do furnish, however, an unusual opportunity to note the difference in the amount of loss due to ear rots as between uniform plantings in different localities.

Table 2. Losses due to ear rots in the uniform comparisons of Krug top crosses expressed as percent damaged (diseased) kernels by weight.

	1935	1936
Columbus, Ohio	3.2	12.5
Lafayette, Indiana	1.2	3.5
Bloomington, Illinois	1.4	2.3
Ames, Iowa	9.0	3.9

Obviously these figures will be of greater significance as similar information for subsequent years becomes available. They have some present interest, however, as actual measurements of losses due to ear rots in important corn producing States over a period of three years.

Publications From Which the Data Given Above Were Obtained

Cooperative Uniform Comparisons of Corn Top Crosses. Mimeographed Reports, March 15, 1936 and March 15, 1937. Division of Cereal Crops and Diseases, Bureau of Plant Industry, U.S.D.A., cooperating with the State Agricultural Experiment Stations. By Merle T. Jenkins.

Corn Varietal Experiments in Ohio. Mimeograph Report No. 34, 1935: Mimeograph Report No. 39, 1936: Mimeograph Report No. 44, 1937. Department of Agronomy, Ohio Agricultural Experiment Station, Wooster, Ohio, by G. H. Stringfield.

Indiana Yield Trials with Dent Corn. Mimeographed Reports, 1935 and 1936. Division of Cereal Crops and Diseases, Bureau of Plant Industry, U.S.D.A., and the Botany Department, Purdue Experiment Station. By R. R. St. John.

Indiana Corn Performance Tests. Results for 1937. Agronomy Department, Purdue Agric. Experiment Station in cooperation with Division of Cereal Crops and Diseases, Bureau of Plant Industry, U.S.D.A. By S. R. Miles

Illinois Corn Performance Tests. Illinois Agricultural Experiment Station.
Bulletin 427. Results for 1935 by G. H. Dungan, J. R. Holbert, W. J. Mumm, J. H. Bigger, and A. L. Lang.
Bulletin 429. Results for 1936 by G. H. Dungan, J. R. Holbert, W. J. Mumm, J. H. Bigger, and A. L. Lang.
Bulletin 440. Results for 1937 by G. H. Dungan, R. O. Snelling, W. J. Mumm, J. H. Bigger, and A. L. Lang.

Iowa Corn Yield Tests. Iowa Agricultural Experiment Station.
Bulletin 343 by Joe L. Robinson and M. M. Rhoades. 1935.
Bulletin 355 by M. M. Rhoades and Joe L. Robinson. 1936.
Bulletin 370 by Joe L. Robinson, R. C. Eckhardt, M. M. Rhoades, and M. S. Zuber. 1937.

(University of Illinois).

LEAF RUST DAMAGE TO OKLAHOMA WHEAT

K. Starr Chester

Since the report of April 2 (Pl. Dis. Rep. 22(7):115. 1938), orange leaf rust (Puccinia rubigo-vera tritici) has developed to a serious extent throughout the major wheat areas of the State, as shown by numerous reports and by examination of 98 wheat fields April 23 and 24. The route followed was from Stillwater southwest to El Reno, west to Clinton, south to Snyder, east to Lawton, north to Enid, and east to Perry. [See map on page 134]. Leaf rust was abundant at nearly all points, with the heaviest damage in the regions around El Reno and Enid and between these points, i. e. the heaviest wheat producing area in the State. Data are not yet available on the Woodward area and the Panhandle, nor on the damage in neighboring States. On the average for the area covered, not less than 30 percent of the leaves have already been destroyed, and in many fields the damage has reached 40 to 50 percent or higher, with the possibility of greater damage before harvest. Very little of the wheat has yet come into head. Stem rust has not yet been observed.

Map showing locations mentioned in reports by K. Starr Chester, page 133, and I. M. Atkins, page 135.

The unusual epidemic development this year is evidently associated with a mild winter, permitting considerable overwintering of inoculum, and an early spring characterized by rainfall of 150 to 200 percent normal, mean temperature of 8° above normal, and strong, continuous south winds. [See p. 119 in the preceding number, and pp. 92 and 93 in the March 15 issue].

Both the soft wheats and the hard wheats are involved in the leaf rust damage. In the soft wheat section, however, the trouble is scattered, and many fields have escaped serious damage, either because rust-resistant varieties, such as Kawvale, have been planted, or because the

fields are more or less isolated, and do not have large rust-infected wheat fields to the southward. The southern part of the hard wheat area is less damaged than the central and northern parts which constitute the principal wheat producing sections of the State.

Frost injury to the crop was of minor importance in nearly all of the areas visited. A few leaves were destroyed, but the plants quickly recovered. The greatest amount of frost damage observed was in the area between Roosevelt and Snyder, and here some injury to the heads was experienced in the early maturing varieties.

(Oklahoma Agricultural and Mechanical College, April 25).

CONDITION OF SMALL GRAINS IN WEST TEXAS
NOTES ON FREEZING INJURY AND RUST OCCURRENCE

I. M. Atkins

(Report of Inspection Trip to West Texas April 15-19, 1938). [See map on page 134]. Following the severe blizzard that occurred in the middle western States, and extended with considerable severity into parts of Texas, it seemed desirable to determine the reaction, to these conditions, of the experimental wheat plantings at Chillicothe and Amarillo, Texas.

Here at Denton the freeze approached the danger point but did not seriously injure small grains. Garden and truck crops were injured by the 30°F. temperature. Sterility due to killing of pollen may be evident later. Small grain in general looks good in the immediate vicinity of Denton. The season is about two weeks ahead of normal. Many early wheat and oat varieties in our experimental plantings are heading, while nearly all barley is headed. Fall oats and barley give promise of producing very high yields. Leaf rust of wheat is widespread and doing considerable damage. Crown rust [*Puccinia coronata*] of oats has appeared almost a month early. Although we have made several rather thorough searches for stem rust in this vicinity as well as on the station, we have not found any to date.

The influence of the freeze became increasingly evident going west from Denton. From Wichita Falls west all foliage on shrubs and trees was killed. No serious damage to grain was noted around Wichita Falls. No fields of Early Blackhull were observed along the road traveled. Leaf rust was prevalent in all fields visited in this area.

At the Chillicothe Substation, the experimental plantings were injured in varying degrees depending upon their stage of growth....

From Childress I went north to Spearman by way of Canadian and Perryton. Wheat on the north plains (north of the Canadian River) is very spotted. A few good fields were observed, but most were poor as to stand and growth. I would estimate that about one-third of the acreage in that area emerged since the February rains. It has made fair growth and on such land there is fair moisture, but the crop will be late if it makes anything. There is considerable acreage abandoned due to dry weather during the winter.... All wheat north of Amarillo is small, stands thin in many instances, and all in need of additional moisture. In my opinion there is little damage due to the freeze (in this area).

South from Amarillo the wheat improves as to stand and growth, but due to this increased growth, was injured more by the freeze. The rank growth in this area has also depleted the moisture very rapidly. South of Tulia (Swisher County) the damage done by the freeze is rather serious. Dry land wheat appeared to have been injured less by the freeze.... Irrigated wheat was so rank that it was injured more by the freeze. Fields that have been irrigated since the freeze are responding with renewed growth. In many of these fields the plants had jointed and although the plant looks good from a distance, the stem below has turned white and appears dead. It is still uncertain whether these culms will be able to come out or whether new growth will have to start from the crown. General rains would no doubt greatly benefit the dry land wheat in its attempt to recover. In this area (Hale, Swisher, Floyd, and Crosby counties) I would estimate the damage from the freeze and greenbugs at from 35 to 50 percent.

On the return trip, considerable damage was noted in Early Blackhull wheat and Missouri Early Beardless Barley (limited acreage) in the vicinity of Seymour and Olney, Texas. It would appear that nearly 50 percent of the wheat in this area is Early Blackhull. Fields of this variety are fully headed. The damage ranges from practically none to as high as 50 percent. From this section south into Haskell, Throckmorton, Jones, Taylor, and Shackelford counties, the reports we get indicate that there was serious damage as a result of the freeze. Wheat of all varieties was very rank and much of it headed.

Mr. P. B. Dunkle, Superintendent, just returned from a hurried trip to Temple and other points in central Texas. They found stem rust [P. graminis] as far north as Dallas, Texas. Stem rust in abundance was found from Waco, Texas south. In some fields it appeared to have overwintered. Small grains in this section are very poor this year. Growth is short, late, and yellow in color. The only known reason is the excessive precipitation in this area during the winter months.

April 22: Found stem rust at Denton, Texas this morning. Earliest we have record of. (I. M. Atkins).

(Division of Cereal Crops and Diseases, Texas Substation No. 6, Denton).

FLAX RUST IN TEXAS

G. E. Altstatt

I was called on to examine some flax in Victoria County from two fields heavily infected with rust, Melampsora lini. Part of each field was planted in the early part of December, 1937, and the flax had come to maturity before the rust infection became severe. The remainder of each field had been sown to flax in the early part of February, 1938, and it appears that the rust infection will reduce the crop by 60 to 75 percent. Lack of rain has prevented the plants from making much growth and all of the plants were infected when observed on April 6. I believe this is the first case of flax rust on cultivated flax in Texas. We had a specimen about April 1 of wild flax taken from Crockett County which was also rust infected.

(Texas Agricultural Experiment Station).

FRUIT DISEASES REPORTED FROM NEW YORK

APPLE SCAB (VENTURIA INAEQUALIS).

Hudson Valley: Scab perithecia have been gradually reaching maturity during the showers of the past week but as yet only a small percentage of the spores have been discharged. At the present time about 80 percent of the perithecia contain some colored spores and about 12 percent have over 50 percent of the asci with colored spores. So far discharge has been obtained only from 5 percent of the leaves when wet in the laboratory. Indications are for a heavy discharge during bloom if rains occur at that time. (D. H. Palmiter, Weekly News Letter, April 25).

Western New York: A light shoot of ascospores occurred in the Reddick McIntosh orchard at Ithaca in melting snow April 11-12. A moderate shoot occurred during the rains of this week end but the bulk of the ascospores in the Reddick orchard still remain to be shot in later rains. (W. D. Mills, Weekly News Letter, April 18).

PEACH LEAF CURL [TAPHRINA DEFORMANS] was found on April 18 on young leaves at Ithaca probably resulting from the warm rain of March 31. (W. D. Mills, Weekly News Letter, April 18).

CEDAR RUSTS (GYMNOSPORANGIUM spp.). (Reports from Weekly News Letter, April 25).

Suffolk County. The telial horns of cedar apple rust [G. juniperi-virginianae] are out. (P. B. Jones).

Orange County. Apple and hawthorn rust galls [G. globosum] have their telial horns well out, and telial masses of quince rust [G. clavipes] are prevalent on many cedars. (R. W. Tousey).

Columbia County. The telial horns of apple rust pushed out a good half inch during this rain. (S. B. Shapley).

OTHER REPORTS ON APPLE SCAB

MASSACHUSETTS: Scab spore development on the whole throughout the state appears to be just about normal at the present writing (April 6), in spite of the unusually warm period during the latter part of March. With fruit buds of McIntosh split and exposing silver tips, but not swollen appreciably, there are scarcely any immature spores present in the majority of the distinctly immature perithecia in the overwintered leaves, that is, in orchards where the leaves are not lying directly on the damp earth. In some cultivated orchards, on the other hand, where the leaves have been in contact with the earth since they dropped last fall, some of the perithecia are almost fully mature with most of the spores entirely ripe and ready to be discharged. Other stages of development exist in the same orchards ranging from the one just cited down to very immature perithecia with no spores differentiated. (O. C. Boyd, Massachusetts State College).

RHODE ISLAND: Of 30 perithecia of Venturia inaequalis examined on overwintered McIntosh leaves from the College orchard at Kingston, April 22, asci were present in all, 15 showed colorless spores, and 8 mature spores. About 5 to 10 percent of the spores are shot. Trap slides, exposed 24 hours in the orchard and examined April 22, showed 4 spores per high power field. The next favorable rain will cause the discharge of a great deal of inoculum. (Frank L. Howard, Rhode Island Agricultural Experiment Station, April 23).

MARYLAND: Ascospores were observed to be darkening from unsprayed McIntosh and Delicious trees in a protected area near College Park on April 1. The same location on April 8, after two days' rain, was shooting

ascospores in great numbers. On the same day ascospores maturing in near-by College commercial orchards of Stayman trees. Leaves collected on April 6 near Frederick, variety unknown, were showing few mature ascospores on April 7 when examined. Apple buds were in late pink stage on McIntosh and early pink stage for Delicious variety.

Olive colored lesions appeared on early formed laves of McIntosh, Delicious, and Chenango on April 21 in above unsprayed orchard. Also beginning to appear on seedlings in College unsprayed nursery. The approximate time to apply the first scab spray under Maryland conditions was broadcast over all local radio stations in Maryland this year, in addition to the regular card service for this important spray. (E. A. Walker, University of Maryland).

BLISTER RUST INFECTION ON PINUS ALBICAULIS IN THE NORTHWEST

T. W. Childs, J. L. Bedwell, and G. H. Englerth

On August 4, 1936, blister rust infection on whitebark pine (Pinus albicaulis Engel.) was discovered at and near timberline on the south side of Mt. Hood (in Oregon) by the writers. Subsequent surveys by this Division have disclosed infection of this species at Hyas Lake in the Wenatchee National Forest, on Mt. Adams, and on Mt. Rainier (all in Washington). This is the first published report of blister rust on this species in the United States. The disease was not found on whitebark pine examined in numerous localities in the Cascade Mountains of Oregon and Washington, the Kaniksu National Forest in extreme northeastern Washington, the Seven Devils Mountains of the Weiser National Forest in Idaho, and the Wallowa and Blue Mountains of northeastern Oregon.

The first discovery of blister rust infection on native whitebark pine was made in 1926 by the Office of Forest Pathology on the Birkenhead River in the Coast Range of British Columbia[1/]. Infection on this species of pine was found by members of the Division of Blister Rust Control along Still Creek and near Government Camp (both in the Mt. Hood National Forest) in 1931 and 1932, respectively. Members of the Division of Plant Disease Control of the Bureau of Entomology and Plant Quarantine recently found considerable infection on whitebark pine in the eastern portion of the St. Joe National Forest in Idaho.

1/ Lachmund, H. G. Investigative work, 1928. Office of Forest Pathology. White Pine Blister Rust Conference Report. Portland, Oregon, December 7, 1928.

Studies conducted by the Division of Forest Pathology have shown this species to be by far the most susceptible of the numerous species tested. These investigations are being continued and will be reported in detail at a later date.

(Division of Forest Pathology, 630 P. O. Building, Portland, Oregon. Maintained at Portland in cooperation with the United States Forest Service).

SYCAMORE DISEASE IN LOUISIANA

Paul V. Siggers

For the past five years a disease of sycamore trees has been noted in Louisiana. The cause of the trouble has not been determined but appears to be a bark-inhabiting fungus which attacks the smaller branches first and eventually reaches the main trunk. The smooth, healthy, grayish-green bark turns brown, and on larger branches the discoloration develops more rapidly longitudinally than laterally. The streaks of infected wood which coalesce above are V-shaped. Stag-head trees are common. Disease symptoms of this general type have been observed at New Orleans, Bogalusa, Baton Rouge, and Clarks. In New Orleans the disease has been virulent enough to result in the removal of all sycamore trees in one of the city parks.

(Division of Forest Pathology).

FOMES ANNOSUS ON PINUS PALUSTRIS

Paul V. Siggers

Fomes annosus[1/] has appeared in a 9-year-old plantation of Pinus palustris near Bogalusa, Louisiana. A study of the plantation record indicated that two trees in adjacent rows died sometime in 1936. At that time no attempt was made to determine the cause of the dying. One of the trees that died in 1936 was number 10 in row 2. Sporophores of F. annosus were collected in December, 1937, from the root crowns of the ninth and the eleventh trees in the same row. Both of the sporophore-bearing trees appeared to be unthrifty, and height growth of one tree had almost stopped. The outbreak is definitely a spot infection. Starting in 1936, three trees within a radius of 30 feet have died and two living trees on the same area were found with 2-year-old fruiting bodies of F. annosus.

(Division of Forest Pathology).

1/ Identified by L. O. Overholts.

A FIELD SURVEY OF SOME OF THE BEAN-GROWING SECTIONS OF MICHIGAN - FALL OF 1937

Florence Hedges

In September 1937, at the beginning of the threshing season, the writer visited some of the bean-growing sections in Michigan, more particularly the "Thumb" in eastern and Mason County in western Michigan - sections where green beans are grown for canning.

Approximately 95 percent of the beans grown in Michigan at the present time are pea beans (not all Robust). Red Kidney, Cranberry beans, garden and canning varieties grown on contract, make up the remainder. Red Kidneys bring the highest prices and hence are favorites in spite of the fact that their average production in bushels per acre is low (6.7 bu. average for 1929-32) and that they are very susceptible to bacterial blights. Pea beans during the same period averaged 13.2 bushels per acre, the highest yields being 25-42, the lowest about 5, bushels per acre. The greatest production area is in the "Thumb" and the Saginaw Valley.

In the 5-year period, 1930-34, Michigan had an average of 33 percent of the acreage devoted to the growing of dry beans in the U. S. and produced 29 percent of the total crop. (Above figures taken from Michigan Agr. Expt. Sta. Special Bulletin 270, 1936).

During the summer of 1937, there was much halo blight (Bacterium medicaginis phaseolicola) on Red Kidneys. Some seed of this variety has been introduced into the State from Idaho in recent years and has given good results the first year.

In Mason County (western Michigan), mosaic had been very bad on all the varieties grown there for the canning of green beans with the exception of Idaho Refugee and U. S. No. 5. The latter had done very well indeed, had been mosaic-free and produced a good crop. One superintendent of a well-known canning company said it was nearest to the type of bean for which he had been looking for canning of anything thus far produced, being of good color and shape, early, and mosaic-resistant. The Idaho Refugee had also produced a good crop.

In the majority of places visited in the pea-bean sections, the seed was only beginning to come in to the elevators and but little of it had been hand-picked. In nearly all samples examined (Ingham, Kent, Saginaw, Bay, and Huron Counties) some bright yellow seeds characteristic of bacterial wilt (B. flaccumfaciens) were present.

In Huron County, which produces about half a million bushels of pea beans annually (567,953 bu. in 1929 according to the 1930 U. S. census), there was a fine crop in the shore section, the best bean growing area of this county at the tip of the "Thumb". They were threshing 30 bushels to the acre on some of the farms. In the central part of the county there had been so much rain that the farmers could not give the proper cultivation and the manager of the Farmers' Elevator at Bad Axe prophesied that 50 percent of the beans would not be harvested because of weeds. The county agent, Mr. Raven, said that despite this, the county as a whole had a good, -- better than average -- crop of pea beans, but yellow, bacterial-wilt-infected seeds were not uncommon in the elevator samples of seeds examined.

There had been much bacterial blight on contract beans, causing defoliation, and also a watersoaking and girdling of the stems, appearing when the plants were about 6 inches high and causing about 90 percent of those so attacked to break over when full-grown. The writer suspects from the description given that B. medicaginis phaseolicola, the organism causing halo blight, was the cause of both the defoliation and the stem girdling.

In Bay County a bumper crop was reported, the best in four or five years. They were threshing 20 to 34 bushels to the acre, and the "pick" thus far was negligible. Some bacterial-wilt-infected seeds were found.

In Lowell (Kent County) the writer saw the photo-electric-eye bean sorter at work in the Runciman Elevator. Two carloads of pea beans are sorted in 24 hours, the seed being put through twice. The machine can be adjusted to detect a greater or less degree of discoloration. Bacterial-wilt-infected seeds were present among the culls. A fine crop was reported for this county also.

A very promising new pea bean, the Michelite, a little earlier and a bit whiter than Robust, has been originated at the Michigan Agricultural Experiment Station. About 500-600 pounds of it were distributed in 1937. Mr. Raven, county agent of Huron County, one of the sections where it is being tested, prophesied that in ten years it would be the best and leading pea bean on the market.

Among the encouraging things observed in Michigan was the effort of one very progressive firm operating ten elevators in the State, to clean up the seedstock by purchasing the very best seed obtainable, usually certified seed, and distributing it amongst the farmers on an even exchange basis, with the exception of last year, when because of the very erratic market, they were compelled to make a small handling charge.

(Division of Fruit and Vegetable Crops and Diseases).

BRIEF NOTES AND A REQUEST

ONION MOSAIC IN KENTUCKY: Onion mosaic specimens received from Whitesburg, in potato onions, with the statement that several farmers are complaining. (W. D. Valleau, Kentucky Agricultural Experiment Station, April 25).

DISEASES OF LETTUCE ON LONG ISLAND: Nassau County. (Reported by Orson S. Cannon in Weekly News Letter for dates indicated). April 18--Lettuce mildew [Bremia lactucae] has been found in some seedbeds along with some gray mold [Botrytis cinerea]. Drop [Sclerotinia sp.] has been found occasionally, and was especially severe on Boston lettuce in coldframes of one grower at Bayside. April 25--Drop and gray mold are rather serious in coldframe lettuce, and in some fields there have been losses due to setting of lettuce and romaine plants with these two diseases. Mosaic of coldframe lettuce was found on one farm.

CEREAL DISEASES IN CALIFORNIA: Barley scald [Rhynchosporium graminicolum] is abundant, some early sown varieties having lost their leaves a month ago. Septoria has damaged some wheat varieties nearly as much. Stem rust [Puccinia graminis] has not been observed in any of the experimental seedings but is abundant on scattered volunteer plants. (C. A. Suneson, Division of Cereal Crops and Diseases, University Farm, Davis. March 16. From Cereal Courier 30: 31. April 10, 1938).

REQUEST FOR INFORMATION: A. G. Newhall reports the earliest appearance of onion downy mildew ever recorded in New York (page 124). The Survey would be grateful for reports on its occurrence in other States.

We should also like to know whether or not conditions in other regions as regards wheat leaf rust infection are similar to those described by K. Starr Chester for Oklahoma (page 133).

WHEAT LEAF RUST IN KANSAS: Natural infections of leaf rust were found to be widely distributed in the vicinity of Manhattan on April 13. This is fully two weeks earlier than usual. Heavy infections of leaf rust have been reported from central Oklahoma. Still heavier infections are known to be present in Texas. There is every indication, therefore, that this is to be a leaf-rust year. Stem rust is still in unknown quantity, although it is known to be developing rapidly in Texas. So far no stem rust has been seen or reported on wheat in Kansas. (C. O. Johnston, Division of Cereal Crops and Diseases, April 20. Cereal Courier 30: 35. April 25).